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Constantinos Paleos

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EXAMINER

SAVAGE, MATTHEW O

ART UNIT

PAPER NUMBER

1797

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/542,665	Applicant(s) PALEOS ET AL.	
	Examiner Matthew O. Savage	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-22 is/are pending in the application.
- 4a) Of the above claim(s) 16, 19 and 22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-15, 18, 20 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4-11-06</u> . | 6) <input type="checkbox"/> Other: _____ |

Applicant's election with traverse of group I, non-symmetric hyperbranched polymers, and powder form in the reply filed on 5-12-09 is acknowledged. The traversal is on the ground(s) that the claims share a novel technical feature. This is not found persuasive because the shared technical feature lacks novelty as evidenced by the art rejections listed below.

The requirement is still deemed proper and is therefore made FINAL.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the at least one inorganic linking group, the aromatic linking group, the aliphatic linking group, the at least one aromatic group, and the combination of the aliphatic group and aromatic group recited in claim 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-15, 17, 18, 20, and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 13, the location of the inorganic or organic linking group in relation to the at least one atom of a chemical element able to form three or more chemical bonds and the at least one aliphatic chain with more than 8 carbon atoms or at least one aromatic group or the combination of the aliphatic chain and the aromatic group is unclear. In addition, it is unclear as to what cavity size is implied by the term "nanocavities".

The exact chemical structure of the non-symmetrical hyperbranched polymers recited in claims 13 and 17 is unclear.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Balogh et al.

With respect to claim 13, Balogh et al disclose a method for encapsulating pollutants including (a) modifying dendrimeric polymers having symmetric chemical structure to contain: at least one atom of a chemical element able to form three or more chemical bonds(e.g., nitrogen, see FIGS. 1-3); at least one organic linking group (e.g., the organo-silicon group shown in FIG. 1; and at least one aromatic group introduced on the surface of the dendrimeric polymer (e.g., the phenyl group mentioned on line 65 of col. 6) rendering the polymers lipophilic, and wherein the modified polymers form nanocavities from the internal chains of the dendrimeric polymers and from the external aromatic groups or combination; and (b) introducing the modified dendrimeric polymers and/or modified non- symmetric hyperbranched polymers into a solution containing pollutants, wherein the pollutants are encapsulated in the nanocavities (see lines 30-33 of col. 1, lines 28-40 of col. 3, lines 52-64 of col. 3, especially line 62 of col. 3).

As to claim 14, Balogh et al disclose the atom of a chemical element able to form three or four chemical bonds as being nitrogen (see FIG. 2).

Concerning claim 15, Balogh et al disclose organic linking group as being aromatic (e.g., the phenyl group mentioned on line 65 of col. 6).

Claims 13, 15, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Chromecek et al.

With respect to claim 13, Chromecek et al disclose a method for encapsulating pollutants comprising: (a) modifying non-symmetric hyperbranched polymers to contain: at least one atom of a chemical element able to form three or more chemical bonds (e.g., carbon, see the chemical structure shown in col. 4); at least one organic linking group; and at least one aliphatic chain with more than 8 carbon (e.g., R", see line 26 of col. 4), wherein the aliphatic chain is introduced on the surface of the hyperbranched polymer; wherein the modifying renders the polymers lipophilic, and wherein the modified polymers form nanocavities (see lines 37-40 of col. 3); and (b) introducing the modified dendrimeric polymers and/or modified non-symmetric hyperbranched polymers into a solution containing pollutants (see example IV in col. 8), wherein the pollutants are encapsulated in the nanocavities.

Concerning claim 15, Chromecek et al disclose an aliphatic linking group (e.g., group R", see line 26 of col. 4).

As to claim 18, Chromecek et al disclose adding the polymer in powder form (see lines 44-47 of col. 4), stirring, and filtering (see example IV in col. 9).

Regarding claim 20, Chromecek et al disclose purifying water (see example IV in col. 8).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balogh et al in view of Chromecek et al.

Balogh et al disclose cutting the polymer into pieces but fails to specify the polymer as being in powder form. Chromecek et al disclose an analogous method including a polymer in the form of a powder (see lines 44-47 of col. 4) that can be added to a solution containing contaminants, stirring the solution, and removing the powder including the pollutants from the water by filtration (see example IV in col. 8) and suggests that such steps facilitate thorough removal of the pollutants from the water. It would have been obvious to have modified the method of Balogh et al so as to have included the steps suggested by Chromecek et al in order to facilitate thorough removal of the pollutants from the water.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balogh et al in view of McCoy et al.

Balogh et al fail to specify regenerating the polymer by treatment with a hot solvent. McCoy et al disclose that it is known to regenerate a sorbent by washing with a solvent capable of dissolving the material being sorbed (see lines 39-50 of col. 5) and teach that such a procedure permits re-use of the solvent. It would have been obvious to have modified the method of Balogh et al so as to have included the step of

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regenerating the sorbent with hot solvent as suggested by McCoy et al in order to enable regeneration and re-use of the sorbent.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chromocek et al in view of McCoy et al.

Chromocek et al fail to specify regenerating the polymer by treatment with a hot solvent. McCoy et al disclose that it is known to regenerate a sorbent by washing with a solvent capable of dissolving the material being sorbed (see lines 39-50 of col. 5) and teach that such a procedure permits re-use of the solvent. It would have been obvious to have modified the method of Chromocek et al so as to have included the step of regenerating the sorbent with hot solvent as suggested by McCoy et al in order to enable regeneration and re-use of the sorbent.

Claims 13-15, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balogh et al in view of Tsiourvas et al and Tomalia et al.

With respect to claim 13, Balogh et al disclose a method of encapsulating pollutants including introducing modified dendrimeric polymers into a solution containing pollutants to encapsulate the pollutants in nanocavities of the modified dendrimers (see lines 30-33 of col. 1, lines 28-40 of col. 3, lines 52-64 of col. 3, especially line 62 of col. 3). Balogh et al fail to specify symmetrical dendrimers having more than 8 carbon atoms introduced on the surface of the hyperbranched polymers, however, Tsiourvas et al disclose that such dendrimers are known in the art. It would have been obvious to have

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modified the method of encapsulating pollutants as suggested by Balogh et al so as to have included the dendrimer as suggested by Tsiourvas et al in order to provide an alternate sorbent for removing pollutants from water. Balogh et al and Tsiourvas et al fail to specify non-symmetric hyperbranched polymers, however, such polymers are known in the art (see FIG. 4 of Tomalia et al mentioned on lines 35-36 of col. 1) and include nanocavities that could obviously be used to encapsulate pollutants in water in a manner similar to that of dendrimers having a symmetrical structure.

Concerning claims 14-15, Balogh et al, Tsiourvas et al, and Tomalia et al disclose the atom of a chemical element able to form three or four chemical bonds as being nitrogen (for example, see FIG. 1 of Tsiourvas et al).

As to claim 15, Tsiourvas et al disclose the linking group as being aliphatic.

Regarding claim 17, Tomalia discloses a non-symmetric hyperbranched polymer that is considered a derivative of the recited anhydrides with diisopropanolamine.

Concerning claim 20, Balogh discloses purifying water (see line 62 of col. 3).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balogh et al in view of Tsiourvas et al and Tomalia et al as applied to claim 13 above, and further in view of Chromecek et al.

Balogh et al disclose cutting the polymer into pieces but fails to specify the polymer as being in powder form. Chromecek et al disclose an analogous method including a polymer in the form of a powder (see lines 44-47 of col. 4) that can be added to a solution containing contaminants, stirring the solution, and removing the powder

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including the pollutants from the water by filtration (see example IV in col. 8) and suggests that such steps facilitate thorough removal of the pollutants from the water. It would have been obvious to have modified the combination suggested by Balogh et al, Tsiourvas et al and Tomalia et al so as to have included the steps suggested by Chromecek et al in order to facilitate thorough removal of the pollutants from the water.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balogh et al in view of Tsiourvas et al and Tomalia et al as applied to claim 13 above, and further in view of McCoy et al.

Balogh et al, Tsiourvas et al and Tomalia et al fail to specify regenerating the polymer by treatment with a hot solvent. McCoy et al disclose that it is known to regenerate a sorbent by washing with a solvent capable of dissolving the material being sorbed (see lines 39-50 of col. 5) and teach that such a procedure permits re-use of the solvent. It would have been obvious to have modified the combination suggested by Balogh et al, Tsiourvas et al and Tomalia et al so as to have included the step of regenerating the sorbent with hot solvent as suggested by McCoy et al in order to enable regeneration and re-use of the sorbent.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O. Savage whose telephone number is (571) 272-1146. The examiner can normally be reached on Monday-Friday, 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew O Savage/
Primary Examiner, Art Unit 1797

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